DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE: EDS00-0027-00(159) Clay/Randolph
EDS00-0027-00(160) Early
EDS00-0027-00(174) Randolph
P.I. Nos. 422230, 422220, & 422235
U.S. 27/S.R. 1 Widening/Reconstruction

OFFICE: Engineering Services

DATE: November 26, 2008

FROM: Ronald E. Wishon, Acting Project Review Engineer REW

TO: Michael A. Haithcock, P.E. Acting State Consultant Design and Program Delivery Eng.

SUBJECT: **IMPLEMENTATION OF VALUE ENGINEERING STUDY ALTERNATIVES**

Recommendations for implementation of Value Engineering Study Alternatives are indicated in the table below. Incorporate the VE alternatives recommended for implementation to the extent reasonable in the design of the project.

ALT #	Description	Potential Savings/LCC	Implement	Comments
EDS00-0027-00(159) Clay/Randolph				
159-2	Reduce the median width to 32'	$940,224	No	The majority of the savings was in Right of Way costs. Most of the Right of Way has already been acquired on this project and the Final Plans are 90% complete.
159-3	Reduce the median width to 20' with a cable barrier and reduce the number of median openings	$1,363,339	No	The majority of the savings was in Right of Way costs. Most of the Right of Way has already been acquired on this project and the Final Plans are 90% complete.
159-4	Use 5' wide paved shoulder	$396,622	Yes	This should be done.
159-8	Reconfigure the alignment to create one-way pairs with the existing northbound roadway	$3,123,542	No	The majority of the savings was in Right of Way costs. Most of the Right of Way has already been acquired on this project and the Final Plans are 90% complete.

ALT #	Description	Potential Savings/LCC	Implement	Comments
EDS00-0027-00(159) Clay/Randolph - continued				
159-11	Reduce the inside travel lanes to 11' and retain 12' wide outside travel lanes	$393,887	Yes	This should be done.
EDS00-0027-00(160) Early				
160-2	Reduce the median width to 32'	$535,144	No	The majority of the savings was in Right of Way costs. Most of the Right of Way has already been acquired on this project.
160-3	Reduce the median width to 20' with a cable barrier and reduce the number of median openings	$501,022	No	The majority of the savings was in Right of Way costs. Most of the Right of Way has already been acquired on this project.
160-4	Use 5' wide paved shoulder	$340,125	Yes	This should be done.
160-5	Evaluate the profile to reduce the quantity of borrow	$1,018,160	Yes	This should be done.
160-7	Reduce the inside travel lanes to 11' and retain 12' wide outside travel lanes	$376,492	Yes	This should be done.
160-13	Eliminate the cattle crossing	$2,795,604	No	Previous commitments have been made by the Department to this property owner.
160-14	Provide an at-grade cattle crossing system	$2,295,604	No	Previous commitments have been made by the Department to this property owner.
160-15	Maintain the existing alignment at Sta. 335+00 to Sta. 370+00 at obliterated pavement	$27,192	No	The majority of the savings was in Right of Way costs. Most of the Right of Way has already been acquired on this project.
160-16	Use guardrail with 2:1 slopes to reduce fill	-$12,913 (cost increase)	No	This results in additional project costs.
160-17	Shorten east-west improvements to CR 267/Colomokee Church/Rockmine Roads	$13,843	Yes	This should be done.

ALT #	Description	Potential Savings/LCC	Implement	Comments
EDS00-0027-00(174) Randolph				
174-1	Use the existing road to the Cuthbert-Randolph Airport	$191,074 (proposed) $166,251 (actual)	Yes /partial	The new driveway access will be constructed to the Right of Way line but the remainder should be done by the developer of the Cuthbert-Randolph Airport expansion. The existing road will be a Right-in/Right-out driveway.
174-5	Reduce the median width to 32'	$688,600	No	The majority of the savings was in Right of Way costs. Most of the Right of Way has already been acquired on this project.
174-6	Reduce the median width to 20' with a cable barrier and reduce the number of median openings	$789,823	No	The majority of the savings was in Right of Way costs. Most of the Right of Way has already been acquired on this project.
174-7	Use 5' wide paved shoulder	$455,364	Yes	This should be done.
174-8	Minimize the number of beams on the bridges	$15,108	No	Almost all of the proposed savings would be negated by re-design costs.
174-10	Replace the box culvert with a precast system at Carter Creek - Stream No. 12	$5,562	No	Almost all of the proposed savings would be negated by re-design costs.
174-11	Replace the box culvert with a precast system for Stream No. 11	-$91,474 (cost increase)	No	This results in additional project costs.
174-12	Evaluate the profile to reduce the quantity of required borrow	$723,125	Yes	This should be done.
174-16	Reduce the inside travel lanes to 11' and retain 12' wide outside travel lanes	$444,025	Yes	This should be done.

A meeting was held on November 21, 2008 and Gunter Hirschler with Moreland Altobelli, Andy Casey, Tim Matthews, and Christopher Rudd with Road Design, Michael Haithcock and Karyn Matthews from the Office of Consultant Design, and Ron Wishon and Lisa Myers of Engineering Services were in attendance.

The results above reflect the consensus of those in attendance and those who provided input.

Approved: _____ **Date:** 11/27/08
Gerald M. Ross, P. E., Chief Engineer

BKS/REW

Attachments

c: R. Wayne Fedora, FHWA
Joe Cowan
Dot Downie
Brent Story
Andy Casey
Tim Matthews
Paul Liles
Bill Ingalsbe
Bill DuVall
Joe King
Steve Gaston
Karyn Matthews
Ken Werho
James Magnus
Amber Phillips
Lisa Myers

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENTAL CORRESPONDENCE

FILE: EDS00-0027-00(159) Clay and Randolph Counties
PI No.: 422230
US 27/SR 1 from Bluffton Bypass to CR 153

OFFICE: Consultant Design

DATE: October 27, 2008

FROM: Michael A. Haithcock, P.E, Assistant State Consultant Design Engineer

TO: Brian Summers, P.E., State Project Review Engineer

SUBJECT: **Value Engineering Study-Responses**

Reference is made to the recommendations that were contained in the *US 27/SR 1 Widening and Reconstruction Value Engineering Study Report -90% Design Stage* dated September 2008 for the above referenced project. Our responses and recommendations are as follows:

1. **Value Engineering Alternative No. 159-2** -Reduce the depressed grassed median width from 44 ft to 32 ft. *Approval of the VE Alternatives No. 159-2 is not recommended.*

   - With the exception of the realignment to the west of the Sutton's Corner Community, the right of way for the project has already been acquired. Therefore, a 32 ft wide median would realize a right of way savings of only 3.1 acres, or $122,000.
   - To realize this right-of-way savings, acquisition would have to be put on hold again, possibly allowing current appraisals to expire and add additional cost.
   - The additional PE work will require a Prior Knowledge Contract (utilizing internal procurement resources) and additional PE funds for this consultant.
   - Implementing this alternate will result in a significant delay to the project. Final plans are 90% complete and this alternate will require modification to cross-sections, staging, erosion control, plan view, driveway profiles, drainage, etc. Assuming the new contract was implemented quickly, the let date would need to move from the current July-2009 to approximately January-2010.
   - However, if implemented, the above considerations would modify the cost/benefit for Alternative 159-2 as follows:

Category	Savings from VE Study Report			Engineer's Estimated Savings		
	Savings	Add'l Cost	Net	Savings	Add'l Cost	Net
Paving	$61,358.00		$61,358.00	$132,280.00		$132,280.00
Grassing	$9,962.00		$9,962.00	$9,962.00		$9,962.00
Right of Way	$868,904.00		$868,904.00	$122,000.00		$122,000.00
Earthwork			$0.00	$290,000.00		$290,000.00
Drainage Structures			$0.00	$94,917.00		$94,917.00
Add'l Engineering (consultant)			$0.00		($465,000.00)	($465,000.00)
			$940,224.00			$184,159.00

2. **Value Engineering Alternative No. 159-3** - Reduce the depressed grassed median width to 20 ft. and use a cable barrier. Reduce the number of median openings to maintain the 2,000 LF distance for a cable barrier system to be effective.
Approval of VE Study Alternative 159-3 is not recommended for the following reasons:

   - With the exception of the realignment to the west of the Sutton's Corner Community, the right of way for the project has already been acquired.
   - The placement of a cable barrier would necessitate the addition of a concrete maintenance strip beneath it.
   - A 20 ft median would provide insufficient refuge between the travel lanes for a passenger car turning left onto US 27/SR 1. A minimum of 25 ft is recommended by AASHTO.
   - A 20 ft median would complicate construction in areas of significant grading with traffic staging. This may require the contractor to use expensive temporary shoring.
   - A 20 ft median width with a cable barrier does not meet the required minimum width of 24 ft if a cable barrier system is installed on center, per the 2002 AASHTO Roadside Design Guide. Per Section 6.4.1.2, the median width should be at least 24 ft if the cable barrier is centered since 12 ft of spacing needs to be provided to accommodate the 12 ft deflection movement. Per Figure C.1.b of the 2002 AASHTO Roadside Design Guide, the cable barrier is not recommended for use in medians narrower that approximately 23 ft. If a 20 ft median were to be constructed, cable barriers would need to be at each median shoulder, doubling the cost of the cable barrier system.
   - Median openings would have minimal pavement reduction as the space between the left turn lane and the opposing travel lane would be too narrow to place a ditch and would need to be paved. Further, pavement 'eyebrows' would need to be constructed on the outside of the median openings in order to accommodate 'U-turns' of larger design vehicles.
   - The median openings at Stations 67+48, 169+00, 312+00, and 324+00 would be relocated, not eliminated, in order to accommodate the 2000 ft minimum length for the cable barriers.
   - The relocation of the median opening at Station 67+48 would either eliminate SB left turn movements onto Fains Hatchery Road/CR 133 or necessitate a significant realignment of this roadway.
   - However, if implemented, the above considerations would modify the cost/benefit for Alternative 159-3 as follows:

Category	Savings from VE Study Report			Engineer's Estimated Savings		
	Savings	Add'l Cost	Net	Savings	Add'l Cost	Net
Paving	$149,987.20		$149,987.20	$149,987.20		$149,987.20
Grassing	$20,018.00		$20,018.00	$20,018.00		$20,018.00
Right of Way	$1,737,809.00		$1,737,809.00	$122,000.00		$122,000.00
Earthwork			$0.00	$580,000.00		$580,000.00
Cable Barriers		($541,940.00)	($541,940.00)		($1,083,880.00)	($1,083,880.00)
Barrier Anchors		($48,000.00)	($48,000.00)		($156,000.00)	($156,000.00)
Concrete Maint. Strip			$0.00		($1,135,176.00)	($1,135,176.00)
Drainage			$0.00	$189,834.00		$189,834.00
Additional Engineering			$0.00		($420,000.00)	($420,000.00)
			$1,317,874.20			**($1,733,216.80)**

3. **Value Engineering Alternative No. 159-4**-Use a 5 ft wide paved outside shoulder instead of a 6.5 ft width.
   Approval of VE Study Alternative 159-4 is recommended.
   - Additional guardrail paving would be necessary as the guardrail offset would remain the same from the original design.
   - If implemented, the above consideration would modify the cost/benefit for Alternative 159-4 as follows:

Category	Savings from VE Study Report			Engineer's Estimated Savings		
	Savings	Add'l Cost	Net	Savings	Add'l Cost	Net
Shoulder Pavement	$399,347.00		$399,347.00	$399,347.00		$399,347.00
Grassing		($2,725.00)	($2,725.00)		($2,725.00)	($2,725.00)
Additional Engineering			$0.00		($20,000.00)	($20,000.00)
			$396,622.00			**$376,622.00**

4. **Value Engineering Alternative No. 159-8**-Use the existing two-lane roadbed for northbound traffic and carry southbound traffic on a new two-lane roadway constructed on the same alignment as the original design. Maintain the intersections at Chulee Road/CR 19 and Hartford Road/SR 37 on the southbound roadway. Retain the overlay of the existing roadbed from Sta 10+00 to Sta 95+00.
   Approval of VE Study Alternative No. 159-8 is not recommended.

   - Driver expectancy for a one-way pair is high traffic, low speed streets in developed areas with a consistent cross street grid. By contrast, US 27/SR1 through Sutton's Corner will be a low traffic, high speed facility through a rural area with few crossing roads.
   - This alternative would create an excessively wide median, with median widths of 380' at Chulee Road/CR 19 and 920' at Hartford Road/SR 37. According to *AASHTO's Geometric Design of Highways and Streets*, page 457, "…..an intersection with a wider median [than 80 ft] may become confusing to some drivers if the median is so wide that a driver on the crossroad approach cannot see the far roadway of the divided highway. Such designs should be avoided…."
   - The lane configuration proposed in Alternative No. 159-8 would inconvenience landowners in the Sutton's Corner community, who would have to travel as much as 0.9 miles in the opposite direction before being able to turn around.
   - An additional PIOH would be necessary as this alternative is substantially different than the alignments proposed to the public.
   - The right of way that can be spared by eliminating NB lanes on the western bypass would only be 16.5 acres, not 23.9 acres as per the VE Study. However, additional savings would also be realized through a reduction in the earthwork.
   - The lane configuration proposed in this alternative would potentially necessitate extending Oakland Avenue/CR 40 from US 27/SR 1's existing location to the SB lanes on the new alignment as per the original design. This would also require an additional SB left turn deceleration lane and would require additional right of way and pavement.
   - The shoulders, ditches, drainage structures, etc. along the existing roadway through Sutton's Corner would need to be improved to accommodate a 65 mph design clear zone. Left turn and right turn deceleration lanes would also need to be constructed along the existing roadway. This would result in additional right of way, earthwork, drainage structures, and pavement costs.

- The project pavement evaluation report recommended the removal of all existing pavement on the mainline travel lanes, though the existing pavement has since been resurfaced. Therefore, additional costs may be incurred by the removal of the existing pavement through Sutton's Corner and its replacement with a new full depth pavement section. For this report, it is assumed that the existing pavement can indeed be overlaid.
- However, if implemented, the above considerations would modify the cost/benefit for Alternative 159-8 as follows:

Category	Savings from VE Study Report			Engineer's Estimated Savings		
	Savings	Add'l Cost	Net	Savings	Add'l Cost	Net
Pavement	$1,477,161.00		$1,477,161.00	$1,477,161.00	($633,000.00)	$844,161.00
Shoulder Pavement	$497,977.00		$497,977.00	$497,977.00	($123,000.00)	$374,977.00
48" storm drain	$13,035.00		$13,035.00	$13,035.00	($24,440.00)	($11,405.00)
42" storm drain			$0.00		($6,382.00)	($6,382.00)
36" storm drain			$0.00		($10,570.00)	($10,570.00)
24" storm drain	$5,214.00		$5,214.00	$5,214.00	($3,258.50)	$1,955.50
18" storm drain	$128,670.00		$128,670.00	$128,670.00		$128,670.00
18" side drain	$48,879.00		$48,879.00	$48,879.00	($29,550.00)	$19,329.00
Right of way SB	$952,606.00		$952,606.00	$655,664.00		$655,664.00
Right of way NB			$0.00		($172,586.00)	($172,586.00)
Earthwork-SB			$0.00	$343,000.00		$343,000.00
Earthwork-NB			$0.00		($335,000.00)	($335,000.00)
Additional Public Meeting			$0.00		($20,000.00)	($20,000.00)
Additional Engineering			$0 00		($380,000.00)	($380,000.00)
			$3,123,542.00			**$1,431,813.50**

5. **Value Engineering Alternative No. 159-11** –Reduce the width of the two inside travel lanes to 11 ft and retain the width of the proposed two outside travel lanes at 12 ft.
Approval of the VE Alternatives No. 159-11 is not recommended.

- According to *2004 AASHTO Geometric Design of Highways and Streets*, page 455, "Roadways on divided arterials should be designed with lanes 3.6 m (12 ft.) wide." Therefore, the reduction of one lane to 11 feet is not recommended for this project.
- This project has a 65 MPH design speed and is expected to be posted at 65 once open to traffic.
- 24-hr truck traffic is approximately 16%.
- The edge of pavement will likely experience deterioration quicker due to truck loading.
- However, if implemented, the above considerations would modify the cost/benefit for Alternative 159-11 as follows:

Category	Savings from VE Study Report			Engineer's Estimated Savings		
	Savings	Add'l Cost	Net	Savings	Add'l Cost	Net
Pavement	$393,887.00		$393,887.00	$393,887.00		$393,887.00
Earthwork			$0.00	$29,758.11		$29,758.11
Add'l Engineering			$0.00		($120,000.00)	($120,000.00)
			$393,887.00			**$303,645.11**

If you have any questions, please contact Karyn Matthews at (404) 631-1584.

MAH: KMM

cc: Genetha Rice Singleton, Assistant Director of Preconstruction
Joe King, Office of Bridge Design
Amber Phillips, Office of Environment/Location
James Magnus, Assistant State Construction Engineer, 11th floor
Carlos Baker, Traffic Operations, TMC
Joe Cowan, District 4 Construction Engineer
Dot Downie, Area Engineer
Route 1, Box 8
Cuthbert, GA 39840

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE EDS00-0027-00(160), Early County
P.I. No. 422220
US 27/SR 1 Widening and Reconstruction

OFFICE Road Design

DATE October 28, 2008

FROM Brent A. Story, P.E., State Road Design Engineer

TO Brian Summers, P.E., State Review Engineer

SUBJECT **Value Engineering Study Report Response**

This office has received and reviewed the recommendations of the Value Engineering Study Workshop Report dated September 26, 2008. Below are our responses to the recommendations:

Alternatives:

160-2 Reduce Median Width to 32 ft:
This alternate is not recommended for implementation.

- Of the $535,144 cost savings outlined in the VE report, $449,716 is related to ROW cost reductions. The right of way is 91% acquired. Therefore, reducing the median would not take in to account the right of way cost savings.
- Implementing this alternative will result 8-12 months of additional time in schedule to complete changes.
- After more detailed calculations, $363,857 can be saved in paving cost for the medians openings, not the $76,138 calculated in the VE report.
- The reduction would also reduce the amount of earthwork which would result in a cost savings of approximately $569,400.
- Factoring in new PE cost for revisions of ~$250,000.00, the new savings would be $683,257.00.

Category	Savings from VE Study			GDOT Engineers Savings		
	Savings	Add'l Cost	Net	Savings	Add'l Cost	Net
Paving	$76,138		$76,138	$363,857		$363,857
Right of Way	$449,716		$449,716	$0.00		$0.00
Earthwork				$569,400		$569,400
Grassing	$9,290		$9,290			
Additional PE					($250,000)	($250,000)
			$535,144.00			**$683,257.00**

160-3 Reduce the median width to 20-ft with cable barrier and reduce # of Median openings: *This alternate is not recommended for implementation.*

- Of the $1,091,342 cost savings outlined in the VE report, $897,339 is related to ROW cost reductions. The right of way is 91% acquired. Therefore, reducing the median would not take in to account the right of way cost savings.
- Per AASHTO 2002 Road Side Design Guide figure C.1.b., Cable systems are not recommended for use in medians narrower than approximately 23-ft.
- A 20-ft median would not allow space for drainage ditches at the median openings. Therefore, this area would have to be paved and reduces the pavement savings.
- Eyebrows would need to be constructed at all median openings to allow for truck u-turns.
- Adding the cost for cable barrier would result in a net cost increase of $571,650. Similar cost savings will result as in ***160-2*** but the increase in cost for cable barrier will negate the overall savings.

160-4 Use 5-ft wide paved outside shoulder:
This alternative is recommended for implementation.

- This section of US27 is not listed as a bike route; therefore, 5-ft wide outside shoulders are acceptable.

160-5 Evaluate the profile to reduce the quantity of borrow:
This alternative is recommended for implementation.

- The profile will be reviewed to determine locations the profile can be adjust without affecting ROW and schedule. Changes will be made on a case by case situation.

160-7 Reduce the inside travel lanes to 11-ft and retain 12-ft wide outside travel lanes: *This alternative is recommended for implementation.*

- Changes will be made based on approval of this VE implementation report by Chief Engineer due to the design variance requirement.

160-13 Eliminate the cattle crossing:
This alternative is not recommended for implementation.

- In response to a letter from the property owner Mr. Harris of White Oak Pastures dated June 9, 2006 addressed to GDOT, the Department agreed to put in a 10x10 culvert to act as a cattle crossing. Due to the rotational grazing program necessary to be certified under the USDA label, cattle must be moved from one pasture to the other on a frequent basis.

160-14 Provide and at-grade cattle crossing system:
This alternative is not recommended for implementation.

- Placing a cattle crossing at grade would result in serious safety issues. Safety concerns include the speed design of 65 mph and the typical section going from two lanes to four lanes with a depressed median.

160-15 Maintain the existing alignment at Station 335+00 to station 370+00 at obliterated pavement: *This alternative is not recommended for implementation.*

- The entire cost savings of $27,192 is associated with ROW costs. This project is in Final Plan Development phase and ROW for the parcels impacted by this change has been acquired. New savings is $0.00.

160-16 Use a guardrail with 2:1 slopes to reduce fill:
This alternative is not recommended for implementation.

- Adding guardrail introduces a safety hazard. This alternative will also increase the project cost.

160-17 Shorten east-west improvements to CR-267/Colomokee Church/Rockmine Roads: *This alternative is recommended for implementation.*

- The profile will be evaluated to determine if the tie-in point can be reduced.

If there are any questions or comments concerning these recommendations, please contact Tim Matthews, P.E. at (404) 631-1552.

BAS:CAC:twm

Attachments

cc: Director of Preconstruction
Lisa Myers, Engineering Services
Tim Matthews, Road Design
Paul Liles/Joe King – Bridge Design
Mike Haithcock/Karyn Matthews – OCD
Glenn Bowman/Amber Phillips – OEL
James Magnus – Construction
Joe Cowan/Dot Downie – District 4 Construction
Carlos Baker – TS&D

32' MEDIAN OPTION.

MEDIAN OPENING AREA = [(650+18)(22) + (120+180)(22)(0.5) + (32+32)(32)](2)
= 40088 ft² = 4454 yd²

12.5 mm ⇒ 4454 yd² (165 lb/yd²) 1 ton/2000 lbs × (11 medians) = 4042 tons.

Cost = (4042 tons)($76/ton) = $307,192

19 mm ⇒ 4454 yd² (220 lb/yd²) 1 ton/2000 lbs × (11 medians) = 5390 tons

Cost = (5390 tons)($75/ton) = $ 404,250

25 mm ⇒ 4454 yd² (440 lb/yd²) 1 ton/2000 lbs × (11 medians) = 10779 tons

Cost = (10779 tons)($71/ton) = $ 797646

GAB 10" ⇒ (4454 yd²)(11) = 48994 yd²

Cost = (48994 sy)($17/sy.) = $ 832,898

AS DESIGNED ⇒ [(450+18')(30) + (32+32)(44) + (210+180)(30)(0.5)](2)
= 46312 ft² = 5146 yd²

12.5 mm ⇒ 5146 yd² (165 lb/yd²) 1 ton/2000 lbs × (11 medians) = 4670 tons.

Cost = (4670 tons)($76/ton) = $354,920

19 mm ⇒ 5146 yd² (220 lb/yd²) 1 ton/2000 lbs × (11 medians) = 6227 tons

Cost = (6227 tons)($75/ton) = $467,025

25 mm ⇒ 5146 yd² (440 lb/yd²) 1 ton/2000 lbs × (11 medians) = 12454 tons.

Cost = (12454 tons)($74/ton) = $ 921,596

GAB 10" ⇒ 5146 yd² (11) = 56606 yd²

Cost = (56606 yd²)($17/sy) = $962,302

TOTAL COST 44' = $2,705,843

TOTAL COST 32' = $ 2,341,986

COST COMPARISON FOR PAVING.

EXISTING - PROPOSED 32' MEDIAN.

$\$2,705,843 - \$2,341,986 = \boxed{\$363,857.^{00}}$

EARTHWORK

$L \times W \times D_{Avg.} \times COST = TOTAL$

L = Length
W = WIDTH
D_{Avg} = AVG DEPTH
COST = $/cy
TOTAL = $

$\frac{TOTAL}{W_{44}} = L \times D \times COST$

$\frac{NEW\,TOTAL}{W_{32}} = L \times D \times COST$

$\frac{TOTAL}{W_{44}} = \frac{New\,total}{W_{32}} \Rightarrow NEW\,TOTAL = \frac{TOTAL}{W_{44}}(W_{32})$

UNCLASS EXCAV = 201602 cy COST = $1,124,940.^{00}$
BORROW EXCAV = 828324 cy COST = $5,897,667.^{00}$

$NEW\,TOTAL_{cut} = \frac{1,124,940}{148}(136) = \$1,033,729$

$NEW\,TOTAL_{BORROW} = \frac{5897667}{148}(136) = \$5,419,478$

COST COMPARISON FOR EARTHWORK.

EXCAV
$EXIST_{44} - PROP_{32} = \$1124940 - \$1033729 = \$91,211$

BORROW
$EXIST_{44} - PROP_{32} = \$5,897,667 - 5,419,478 = \$478,189$

TOTAL COST SAVINGS = $\boxed{\$569,400}$

PE COST $\approx \$250,000$

HAROLD E. LINNENKOHL
COMMISSIONER
(404) 656-5206

DAVID E. STUDSTILL, JR.,
CHIEF ENGINEER
(404) 656-5277

Department of Transportation

State of Georgia
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Atlanta, Georgia 30334-1002

BUDDY GRATTON, P.E.
DEPUTY COMMISSIONER
(404) 656-5212

EARL L. MAHFUZ
TREASURER
(404) 656-5224

December 11, 2006

EDS-27 (160) Early/Clay Counties
P.I. No. 422220

Mr. Will Harris
White Oak Pastures
P.O. Box 98
Bluffton, Georgia 39824

RE: Cattle Crossing

Dear Mr. Harris:

Thank you for your letter dated November 17, 2006. The Department would like to first apologize for the mishandling of the Pre-Acquisition meeting notice to you. I can assure you that this oversight was not deliberate, and I trust that our quick response to your dilemma restored any loss of confidence that you may have had.

In regard to your concerns, I understand that a representative of the Department contacted you soon after the aforementioned meeting and discussed the issues in question as well as the measures that the Department has taken to alleviate those concerns pertinent to your property as well as your business.

I was also informed that the GDOT's representative believes that you were satisfied with our effort to accommodate your concerns into the proposed project design.

Again, thank you for your letter. We look forward to maintaining your trust.

Sincerely,

Harold E. Linnenkohl
Commissioner

BAS:JLM:ss

bcc: David Studstill
Buddy Gratton
Earl Mahfuz
Paul Bryan

20060970

Since 1866
Will Harris Farm
P.O. Box 98
Bluffton, GA 39824

Office: (229) 641-2081 **www.whiteoakpastures.com** **Mobil: (229) 317-0203**

June 9, 2006

Commander, U.S. Army Corps of Engineers
Savannah District
Attention: Regulatory Branch
P.O. Box 889
Savannah, GA 31402-0889

Georgia Department of Transportation
Office of Environmental/Location
3993 Aviation Circle
Atlanta, GA 30336-1593

I own land on the east and west side of US Highway 27 in Early County, Georgia. My farm is devoted exclusively to the production of beef cattle and the operation of this farm is my full-time occupation. I market my beef through Publix Supermarkets under my own USDA approved grassfed label. As an aid in marketing our beef, we have had our farm "Certified Humane" by Humane Farm Animal Care.

I bring these facts to your attention because my grassfed production protocol requires that I move my cattle constantly from one pasture to another on a Rotational Grazing Program. The widening of US 27 will make it dangerous to move my cattle across the road. My family has owned this property since before there was a Fence Law. We have always crossed the road with our cattle.

The inability to regularly move my cattle across the road will result in a financial hardship for my family. I have proposed that DOT furnish me with a tunnel to accommodate moving my cattle. They have offered an 8' X 8' passage, Humane Farm Animal Care requires a minimum 10' X 10' opening to move my cattle through in order for my farm to keep our Certified Humane status.

I also pull hay trailers back and forth from one side of the road to the other. It is important that I coordinate areas for this cross over with someone in the design department.

Our farm has been in our direct family for 5 generations. Thank you for your consideration in this matter that is so important to us.

Sincerely,

Will Harris.

Will Harris

Todd Long:
Please look into this and get back with me. We need a letter response prepared to Mr. Harris for my signature.
Harold

Since 1866
WHITE OAK PASTURES
P.O. Box 98
Bluffton, GA 39824

Office: (229) 641-2081 **www.whiteoakpastures.com** **Mobil: (229) 317-0203**

November 17, 2004.

Mr. Harold Linnekohl
Mr. David Studstill
Mr. Buddy Gratton
Mr. Earl Mahfuz
Mr. Paul C. Bryan

NOV 22 2004

Dear Sirs,

This morning I received a letter dated November 9 from Mr. Paul C. Bryan announcing a Pre-Acquisition meeting that was held last night. The letter's delivery was delayed because it had been mailed to the wrong address. Enclosed is a copy of the envelope verifying this incorrect mailing that caused me to miss this important meeting.

I have concerns regarding the widening of Highway 27 through my farm because I am in the Grassfed cattle and beef business and own land on both sides of Highway 27. I move my cattle from pasture to pasture frequently because a rotational grazing program is necessary for my Grassfed Beef Program. My family has run cattle on both sides of this road since before there was a Fence Law in Georgia. DOT previously indicated that they would provide an 8 foot X 8 foot tunnel to accommodate my grazing program.

Because I market my beef under my own USDA approved label, I have had my farm *Certified Humane* by *Humane Farm Animal Care*. Their Consultant, Dr. Temple Grandin requires that I provide a minimum 10 foot X 10 foot opening for my cattle. I have previously made DOT aware of this requirement, but have received no acknowledgement that they would provide this larger opening for my cattle to pass through. This situation will have a significant economic impact on my farm operation.

Respectfully,
Will Harris.
Will Harris
Land Owner

Since 1866
WHITE OAK PASTURES
www.whiteoakpastures.com

WILL HARRIS
PRESIDENT

P.O. Box 98
Bluffton, GA 39824

Office: (229) 641-2081
Mobile: (229) 317-0203

willharris@whiteoakpastures.com

WHITE OAK PASTURES®
Since 1866

*Natural**

GRASSFED GROUND BEEF

*MINIMALLY PROCESSED - CONTAINS NO ARTIFICIAL INGREDIENTS

Grassfed Beef is better because:

• It is Healthier.
More of the right fats, less of the wrong fats. Grassfed beef is higher in Omega 3's, conjugated linoleic acid (CLA), and beta carotene. It contains no added hormones or antibiotics.

• It is Safer.
Our homegrown cattle are farm raised from birth. This is the ultimate source verification. No worries about E. Coli or mad cow disease (BSE) with our beef.

• It Tastes Better.
Our ground beef contains all of the high value steak cuts. This unprecedented procedure gives our beef its unique high quality.

• It is the Right Thing to do.
Our production protocol supports: The humane treatment of animals, independent family farmers, and environmentally sustainable practices.

...We choose to allow our cattle to ***roam freely***, as nature intended. We are ***"certified humane"*** by Humane Farm Animal Care.

...Pasture based agriculture is among the most ***environmentally friendly*** of the sustainable farming practices.

...You support ***American family farmers source verified beef,*** instead of corporate factory farms.

...Our cattle thrive on a purely vegetarian diet that contains ***no animal by-products.*** This further enhances your ***health and safety.***

...Beef produced naturally on grass ***tastes better.*** White Oak Pastures ***includes all of the high value steaks*** in our Grassfed Ground Beef.

...Grassfed beef is higher in beta carotene, vitamin E, conjugated linoleic acid (CLA), and omega 3 fatty acids. That is why it is ***healthier for you.***

...Cattle should not be forced to fatten on high grain feed concentrates in industrial feedlots. Our cattle are given ***no antibiotics*** and ***no hormone implants.***

...Grassfed cattle have a naturally alkaline rumen. ***This minimizes the possibility of E.coli O157:H7 contamination.***

WHITE OAK PASTURES
•SINCE 1866•
No Antibiotics
No Added Hormones
*Natural**
GRASSFED BEEF
*INGREDIENTS: MINIMALLY PROCESSED GROUND BEEF - CONTAINS NO ARTIFICIAL INGREDIENTS.

Cattle raised, fed and handled in a humane manner in accordance with White Oak Pastures' "All Natural Protocol"

- *Born, raised and processed in the USA*
- *Raised free-range and free-roaming*
- *Not raised on public lands*
- *Never used as dairy cattle*
- *Grassfed, never fed animal by-products*
- *Raised without antibiotics*
- *Raised without added hormones*
- *Any supplemental feeding minimal and limited to natural grains and forages*

Source verified by White Oak Pastures, Inc.

CERTIFIED HUMANE · GEORGIA GROWN · American Grassfed · Not just beef USA BEEF · MAKER'S DIET APPROVED TMDiet.com

Will Harris
White Oak Pastures • Bluffton, Georgia
229-641-2081 • willharris@whiteoakpastures.com

www.whiteoakpastures.com

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENTAL CORRESPONDENCE

FILE: EDS00-0027-00(174) Randolph Counties
PI No.: 422235
US 27/SR 1 fm CR 153 to the Cuthbert Byp

OFFICE: Consultant Design

DATE: October 27, 2008

FROM: Michael A. Haithcock, P.E, Assistant State Consultant Design Engineer

TO: Brian Summers, P.E., State Project Review Engineer

SUBJECT: **Value Engineering Study-Responses**

Reference is made to the recommendations that were contained in the *US 27/SR 1 Widening and Reconstruction Value Engineering Study Report -90% Design Stage* dated September 2008 for the above referenced project. Our responses and recommendations are as follows:

1. **Value Engineering Alternative No. 174-1** - Eliminate the new airport access road and retain the existing access road.
Approval of the VE Alternative 174-1 is not recommended for the following reasons:

- The Cuthbert-Randolph Airport is presently undergoing expansion/renovation planning and has requested that the access drive be moved to their design location to facilitate their expansion.
- This alternative would require the relocation and reconstruction of the median opening in the future, when the relocated Airport Drive is to be built with the Airport Expansion. The proposed median opening is located on a horizontal curve along US 27/SR 1 which requires a split profile for drainage purposes. The drainage system, signing and marking, earthwork, as well as the pavement for the median relocation would need to be done under traffic already utilizing the reconstructed roadway.
- As proposed, the relocated Airport Drive provides a 24 ft pavement width compared to the existing 14 ft pavement width.
- The Right of Way already exists for the relocated driveway entrance.
- However, if implemented, the above considerations would modify the cost/benefit for Alternative 174-1 as follows:

Category	Savings from VE Study			Engineer's estimated savings		
	Savings	Add'l Cost	Net	Savings	Add'l Cost	Net
Paving	$119,280.00		$119,280.00	$121,075.00		$121,075.00
Asph. Overlay		($13,374.00)	($13,374.00)		($9,153.00)	($9,153.00)
Patching		($4,065.00)	($4,065.00)		($3,170.00)	($3,170.00)
Drainage				$3,374.00		$3,374.00
Right of Way	$61,233.00		$61,233.00	$0.00		$0.00
Grassing				$1,316.00		$1,316.00
Earthwork	$28,000.00		$28,000.00	$12,017.00		$12,017.00
Add'l Engineering					($50,000.00)	($50,000.00)
			$191,074.00			**$75,459.00**

2. **Value Engineering Alternative No. 174-5** - Reduce depressed grassed median width from 44 ft to 32 ft. *Approval of the VE Alternatives No. 174-5 is not recommended.*

- The majority of the right of way for the project has already been acquired. Therefore, a 32 ft wide median would not realize any right of way savings.
- The additional PE work will require a Prior Knowledge Contract (utilizing internal procurement resources) and additional PE funds for this consultant.
- Implementing this alternate will result in a significant delay to the project. Final plans are FFPR-ready and this alternate will require modification to cross-sections, staging, erosion control, plan view, driveway profiles, drainage, etc. Assuming the new contract was implemented quickly, the let date would need to move from the current July-2009 to approximately January-2010.
- Earthwork savings have been added into the estimate below, however by implementing Alterative No. 174-12 (profile reductions), this savings will be reduced.
- However, if implemented, the above considerations would modify the cost/benefit for Alternative 174-5 as follows:

Category	Savings from VE Study			Engineer's Estimated Savings		
	Savings	Add'l Cost	Net	Savings	Add'l Cost	Net
Paving (Medians)	$88,608.00		$88,608.00	$450,527.00		$450,527.00
Grassing	$10,526.00		$10,526.00	$11,842.00		$11,842.00
Right of Way	$589,466.00		$589,466.00	$0.00		$0.00
Earthwork				$588,734.00		$588,734.00
Drainage				$84,458.00		$84,458.00
Add'l Engineering (consultant)					($570,000.00)	($570,000.00)
			$688,600.00			**$565,561.00**

3. **Value Engineering Alternative No. 174-6** - Reduce the depressed grassed median width to 20 ft. and use a cable barrier. Reduce the number of median openings to maintain the 2,000 LF distance for a cable barrier system to be effective.
Approval of VE Study Alternative 174-6 is not recommended for the following reasons:

- The majority of the right of way for the project has already been acquired.
- The placement of a cable barrier would increase maintenance in the median as mowing would become more difficult if a concrete maintenance strip is not used.
- A 20 ft median would provide insufficient refuge between the travel lanes for a passenger car turning left onto US 27/SR 1. A minimum of 25 ft is recommended by AASHTO.
- A 20 ft median would complicate construction in areas of significant grading with traffic staging. This may require the contractor to use expensive temporary shoring.
- The proposed 20 ft median width with a cable barrier does not meet the required minimum width of 24 ft if a cable barrier system is installed on center, per the 2002 AASHTO Roadside Design Guide. Per Section 6.4.1.2, the median width should be at least 24 ft if the cable barrier is centered since 12 ft of spacing needs to be provided to accommodate the 12 ft deflection movement. Per Figure C.1.b of the 2002 AASHTO Roadside Design Guide, the cable barrier is not recommended for use in medians narrower than approximately 23 ft. If a 20 ft median were to be constructed, cable barriers would need to be constructed at each median shoulder, doubling the cost of the cable barrier system.

- If centered, the cable barrier would interfere with median drainage and maintenance thereof.
- Median openings would have minimal pavement reduction as the space between the left turn lane and the opposing travel lane would be too narrow to place a ditch and would need to be paved. Further, pavement 'eyebrows' would need to be constructed on the outside of the median openings in order to accommodate 'U-turns' of larger design vehicles.
- 7 median openings would need to be eliminated in order to accommodate the 2000 ft minimum length for the cable barriers instead of the 4 mentioned in the VE Study. The median openings to be eliminated would occur at Stations 475+00, 527+00, 630+00, 660+20, 728+88, 808+00, and 845+00. This would severely inconvenience property owners along US 27/SR 1, who would have to travel as much as 3/4 miles in the opposite direction before being able to turn around.
- However, if implemented, the above considerations would modify the cost/benefit for Alternative 174-6 as follows:

Category	Savings from VE Study Report			Engineer's Estimated Savings		
	Savings	Add'l Cost	Net	Savings	Add'l Cost	Net
Paving	$222,670.00		$222,670.00	$1,600,000.00		$1,600,000.00
Drainage			$0.00	$243,515.00		$243,515.00
Grassing	$21,333.00		$21,333.00	$21,333.00		$21,333.00
Right of Way	$1,181,472.00		$1,181,472.00	$0.00		$0.00
Earthwork			$0.00	$1,391,197.00		$1,391,197.00
Cable Barrier		($575,652.00)	($575,652.00)		($1,151,304)	($1,151,304.00)
Barrier Anchors		($60,000.00)	($60,000.00)		($120,000.00)	($120,000.00)
Conc. Maint. Strip					($1,500,000.00)	($1,500,000.00)
Add'l Engineering					($535,000.00)	($535,000.00)
			$789,823.00			**($50,259.00)**

4. **Value Engineering Alternative No. 174-7** - Use a 5 ft wide paved outside shoulder instead of a 6.5 ft width.

   Approval of VE Study Alternative 174-7 is recommended with the following notations:

   - Additional guardrail paving would still be necessary as the guardrail offset would remain the same as the original design.
   - If implemented, the above considerations would modify the cost/benefit for Alternative 174-7 as follows:

Category	Savings from VE Study Report			Engineer's Estimated Savings		
	Savings	Add'l Cost	Net	Savings	Add'l Cost	Net
Pavement	$458,371.00		$458,371.00	$378,015.00		$378,015.00
Grassing		($3,007.00)	($3,007.00)		($2,350.00)	($2,350.00)
Add'l Engineering					($70,000.00)	($70,000.00)
			$455,364.00			**$305,665.00**

5. **Value Engineering Alternative No. 174-8** – For Bridge Spans 1 and 2, increase the beam spacing to 8'-9" on center using a concrete compressive strength of 7 ksi.
Approval of VE Study Alternative No. 174-8 is not recommended. Calculations have previously been submitted to the GDOT Structural Department for analysis and verification.
Although the alternative expedites construction by one less beam placement, reduces the number of beams, and reduces construction time, the following will impact the costs of the alternate:
   - Uses different beam spacing between spans 1, 2, & 3.
   - Complicates Bent layouts and Design.
   - Adds more deck concrete
   - Adds more rebar and placement time.
   - Will require a redesign of the bridge.
   - However, if implemented, the above considerations would modify the cost/benefit for Alternative 174-08 as follows:

Category	Savings from VE Study			Engineer's Estimated Savings		
	Savings	Add'l Cost	Net	Savings	Add'l Cost	Net
Span 1 – Delete Type II Beam	$12,301.00		$12,301.00	$13,602.00		$13,602.00
Span 1 – Increase Slab Conc.		($5,502.00)	($5,502.00)		($7,314.00)	($7,314.00)
Span 1 – Increase Reinf.		($1,592.00)	($1,592.00)		($1,051.00)	($1,051.00)
Span 2 – Delete Type II Beam	$19,622.00		$19,622.00	$18,614.00		$18,614.00
Span 2 – Increase Slab Conc.		($7,406.00)	($7,406.00)		($7,884.00)	($7,884.00)
Span 2 – Increase Reinf.		($2,314.00)	($2,314.00)		($2,444.00)	($2,444.00)
Add'l Engineering					($50,000.00)	($50,000.00)
			$15,109.00			**($13,523.00)**

6. **Value Engineering Alternative No. 174-10** – Replace the double 9x9 concrete culvert with a precast arched single-span structure.
Approval of VE Study Alternative No. 174-10 is not recommended.

   - A larger conspan structure will be required due to the arch, which decreases the area of opening.
   - The parapets and wingwalls would be similar in either case and are omitted in these calculations.
   - A credit could be given due to the shorter construction time, which could result in a smaller bid for the construction of this item. But, the credit would have to be substantial in order to realize any savings based on the calculations below. This is an individual Contractor item so no cost is provided.
   - However, if implemented, the above considerations would modify the cost/benefit for Alternative 174-10 as follows:

Category	Savings from VE Study Report			Engineer's Estimated Savings		
	Savings	Add'l Cost	Net	Savings	Add'l Cost	Net
Class A Concrete	$417,592.00		$417,592.00	$417,592.00		$417,592.00
Bar Reinf.	$89,854.00		$89,854.00	$89,854.00		$89,854.00
ConSpan Mat'l (279-20x9)					($335,000.00)	($335,000.00)
Erection					($75,000.00)	($75,000.00)
Foundation Slab					($186,500.00)	($186,500.00)
Critical Backfill					($64,800.00)	($64,800.00)
Hydro Report					($5,000.00)	($5,000.00)
Add'l Engineering					($25,000.00)	($25,000.00)
			$507,446.00			**($183,854.00)**

7. **Value Engineering Alternative No. 174-11** – Replace the double 10x10 concrete box culvert with a precast attached single-span structure.
Approval of the VE Alternate No. 174-11 is not recommended.

- A larger conspan structure will be required due to the arch, which decreases the area of opening.
- The parapets and wingwalls would be similar in either case and are omitted in these calculations.
- A credit could be given due to the shorter construction time, which could result in a smaller bid for the construction of this item. But, the credit would have to be substantial in order to realize any savings based on the calculations below. This is an individual Contractor item so no cost is provided.
- However, if implemented, the above considerations would modify the cost/benefit for Alternative 174-11 as follows:

Category	Savings from VE Study			Engineer's Estimated Savings		
	Savings	Add'l Cost	Net	Savings	Add'l Cost	Net
Class A Concrete	$387,591.00		$387,591.00	$387,591.00		$387,591.00
Bar Reinf.	$88,178.00		$88,178.00	$88,178.00		$88,178.00
ConSpan Mat'l (217-24x10)					($315,000.00)	($315,000.00)
Erection					($75,000.00)	($75,000.00)
Foundation Slab					($170,000.00)	($170,000.00)
Critical Backfill					($58,725.00)	($58,725.00)
Hydro Report					($5,000.00)	($5,000.00)
Add'l Engineering					($20,000.00)	($20,000.00)
			$475,769.00			**($167,956.00)**

8. **Value Engineering Alternative No. 174-12** – Adjust the profile to reduce the amount of required fill embankment in an effort to reduce the necessary borrow.
Approval of the VE Alternate No. 174-12 is recommended with the following notation:

- Extensive plan revisions will be required. The additional PE work will require a Prior Knowledge Contract (utilizing internal procurement resources) and additional PE funds for this consultant.
- Implementation of alternative 174-12 would modify the cost/benefit as follows:

Category	Savings from VE Study			Engineer's Estimated Savings		
	Savings	Add'l Cost	Net	Savings	Add'l Cost	Net
Borrow	$723,125.00		$723,125.00	$1,466,894.00		$1,466,894.00
Unclassified Excavation					($338,840.00)	($338,840.00)
Add'l Engineering					($292,000.00)	($292,000.00)
			$723,125.00			**$836,054.00**

9. **Value Engineering Alternative No. 174-16** – Reduce the width of the two inside travel lanes to 11 ft and retain the width of the proposed two outside travel lanes at 12 ft.
Approval of the VE Alternatives No. 174-16 is not recommended due to the following reason:

- According to *2004 AASHTO Geometric Design of Highways and Streets*, page 455, "Roadways on divided arterials should be designed with lanes 3.6 m (12 ft.) wide." Therefore, the reduction of one lane to 11 feet is not recommended for this project.
- This project has a 65 MPH design speed and is expected to be posted at 65 once open to traffic.
- 24-hr truck traffic is approximately 16%.
- The edge of pavement will likely experience deterioration quicker due to truck loading.
- However, if implemented, the above considerations would modify the cost/benefit for Alternative 174-16 as follows:

Category	Savings from VE Study			Engineer's Estimated Savings		
	Savings	Add'l Cost	Net	Savings	Add'l Cost	Net
Pavement	$393,887.00		$393,887.00	$393,887.00		$393,887.00
Earthwork				$29,758.11		$29,758.11
Add'l Engineering					($250,000.00)	($250,000.00)
			$393,887.00			**$173,645.11**

If you have any questions, please contact Karyn Matthews at (404) 631-1584.

MAH: KMM

cc: Genetha Rice Singleton, Assistant Director of Preconstruction
Joe King, Office of Bridge Design
Amber Phillips, Office of Environment/Location
James Magnus, Assistant State Construction Engineer, 11th floor
Carlos Baker, Traffic Operations, TMC
Joe Cowan, District 4 Construction Engineer
Dot Downie, Area Engineer
Route 1, Box 8, Cuthbert, GA 39840